

RS9G

MULTIFUNCTION PROTECTIVE RELAY



1 DESCRIPTION

The RS9G device is a multifunction protective relay specialized in protecting generators and transformers. In addition to the RS9 functions, it adds differential protection and directional power/current/voltage protection functions. Moreover the RS9G+ variant adds thermal image and 27T protection functions for an integral protection of the generator.

2 FUNCTIONS

The RS9G device can provide the following protection functions:

- Inverse time (51/51N) and instantaneous (50/50N) overcurrent protection.
- Directional Power (32) and Phase-balance current (46) and voltage (47) protection.
- Overvoltage (59) and undervoltage protection (27727T).
- Differential protection (87).
- Max/min Frequency protection (81m/81M).
- Circuit breaker monitoring functions, kA² counter and fault counter alarm.
- Remote/Local operation selectable over configurable digital input.
- Select before operate.
- Fully field/remote upgradable software.
- 8-channel oscillography with 64 samples/cycle (COMTRADE format).
- Non volatile storage for up to 200 events.
- 16 optoisolated configurable digital inputs.
- 8 SPDT 16A configurable relay outputs.
- Continuous self-monitoring

There is a large graphic display, a keyboard and 27 LEDs (20 of them are fully configurable, being 2 bi-colored) for easy field operation.

Pug-in screw connectors for fast a secure connection.

The unit is configurable though the front panel interface (password protect) and also through the serial COM1 to a laptop with a standard terminal software (puTTY, HyperTerminal, TeraTerm).

The device is available with a commissioning / configuration software that allows defining different settings profiles, storing the event log and oscillograms in a file, simulating communication transfers to verify a correct interoperability with control center and showing internal and external signal status.

3 COMMUNICATIONS

The RS9G protection is completely interoperable with any commercial RTU compliant with either PROCOME or MODBUS communication standards. They use RS485 port, COM2 and COM3 respectively.

4 TECHNICAL SPECIFICATIONS

Power supply			
Auxiliary input voltage	Option 12:	9 – 18 Vdc	
	Option 48:	36 – 150 Vdc	
	Option 220:	176 – 264 Vac	
Consumption:	<5 W		
Digital Inputs			
Detection level	Option 12:	Low:	0 – 4 Vdc
		High:	8.6 – 18 Vdc
	Option 48:	Low:	0 – 10 Vdc
		High:	34 – 60 Vdc
	Option 220:	Low:	0 – 40 Vac
		High:	160 – 264 Vac
Power consumption (at nominal voltage)	<0,1 W		
Cabling Section	2.5 mm²		
Digital Outputs			
Nominal Voltage	250 V		
Maximum load current	15 A		
Cabling Section	2.5 mm²		
Configuration	SPDT Relay Output.		
Analog Inputs			
Current			
Nominal Current (Inom)	1 ó 5 A (consumption 0.05VA)		
Thermal Current	5 x Inom (permanent) / 25 x Inom (1s)		
Accuracy	±1 % (0.1 ... 20 x Inom)		
Voltage			
Nominal voltage (Unom) / max input voltage	Option 12/220	230 / 275 Vac	
	Option 48	110 / 150 Vdc	
Accuracy	±1 % (0.05 ... 1.2 x Unom)		
Frequency			
Measure range	Fnom ± 5 Hz		
Accuracy	± 0.02 Hz		
Others			
Working Temperature	-10 ÷ 60 °C		

5 TESTINGS

- Dielectric strength: 2kV / 50Hz 1 min. according C.E.I 255-5.
- Surge 5 kV. peak 1.2/50 μ s according C.E.I 255-5.
- Electrical disturbance testing of 1 MHz: 2.5 kV longitudinal y 1kV transversal, class III according CEI 255-5.
- Fast transient: 2kV according CEI 255-22-4 class III.
- Electromagnetic immunity tests: according to document UNPEDE ref NORM (SPEC) 13."Automation and Control Apparatus for Generating Stations and Substations – Electromagnetic Compatibility Requirements."

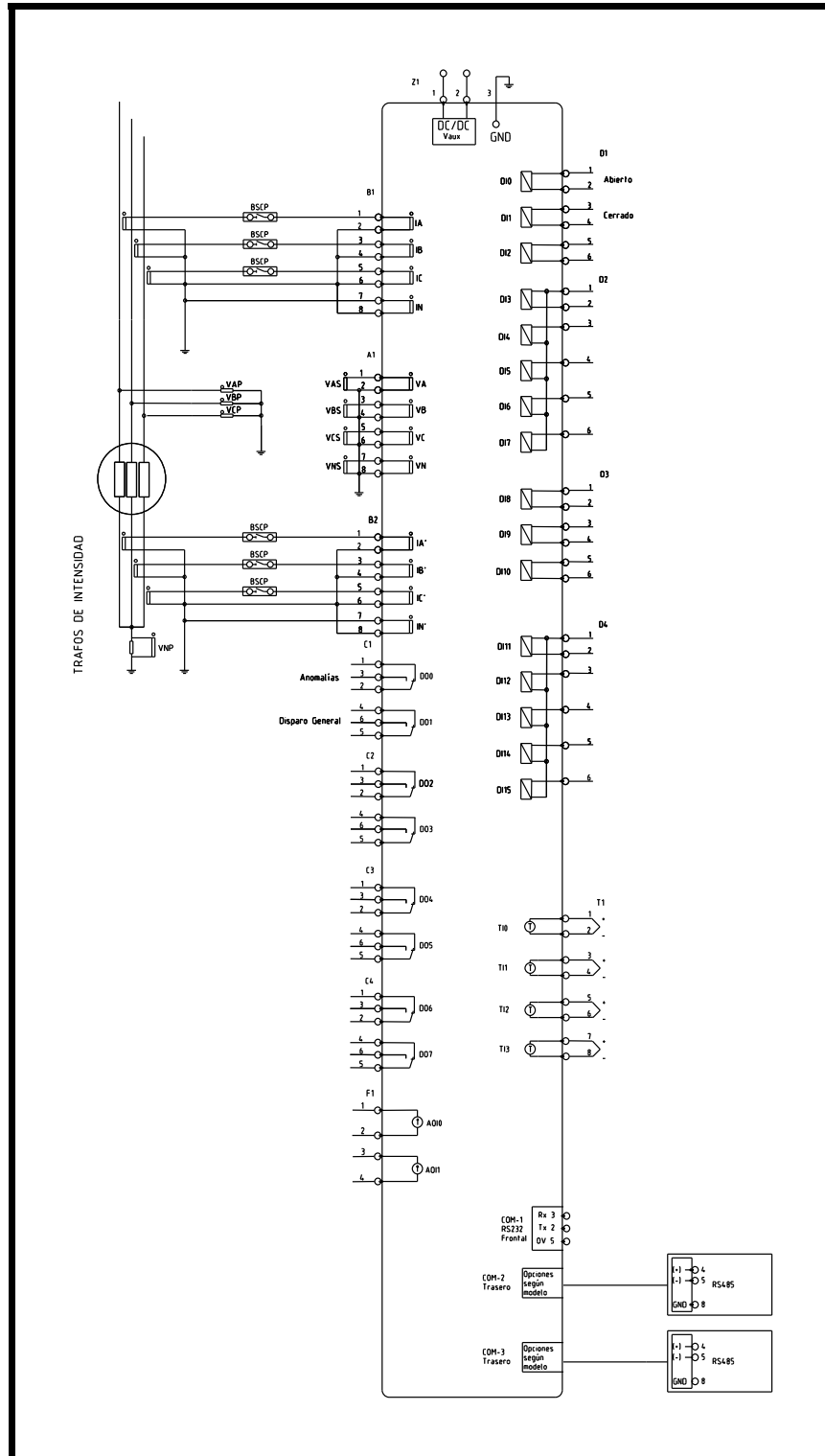
6 ORDERING CODES

Options	
RS9	50/51 + 50/51N
RS9D	50/51 + 50/51N + 67/67N
RS9F	50/51 + 50/51N + 59/59N + 27/27N + 81
RS9G	50/51 + 50/51N + 59/59N + 27/27N + 81 + 87/87N + 32 + 46 + 47
RS9G+	50/51 + 50/51N + 59/59N + 27/27N/27T + 81 + 87/87N + 32 + 46 + 47 + 49
RS9L	50/51 + 50/51N + 59+ 27 + Automatic Transfer Line
MMF9	81
RPI9	32+46+47
MTA9	27 + 59

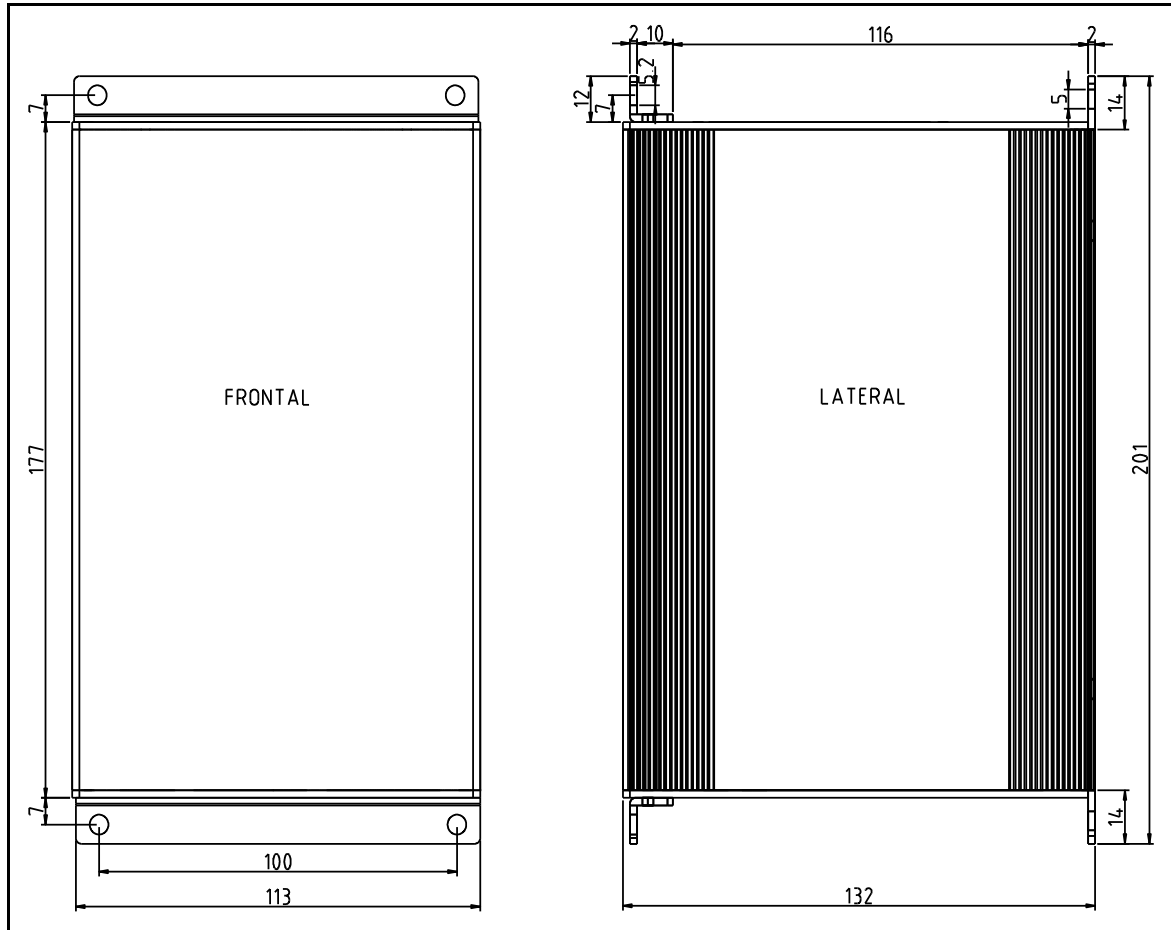
X .Y / A B - P - M - C + I

Analog Inputs		Nominal Values		Power supply		Mounting		Communications		Digital IO	
X	Current Inputs	A	Current	12	9 – 18 Vdc	M	Rear		None	1	8 DI + 4 DO
Y	Voltage Inputs	B	Voltage	24	18 – 36 Vdc	E	Frontal	1TP	1x RS485/RJ45	2	16 DI + 8 DO
X/Y Options		A Options		48	36 – 72 Vdc	D	DIN rail	2TP	2x RS485/RJ45	3	24 DI + 12 DO
	None		None	110	36 – 150 Vdc			ETH	Ethernet		
1	1E	1A	Inom = 1A	220	85 – 264 Vca						
3	2P+1E	5A	Inom = 5A	M	88 – 276 Vdc						
4	3P	B Options									
5	3P+1E		None								
		110V	Unom = 110V								
		220V	Unom =220V								

7 CONNECTION SCHEMATICS



8 **SIZE**



Flush/wall mount version shown. Device without frontal fastenings and rear DIN rail mount also available.